

WHAT IS CLAIMED IS:

1. A method of the production of a nanoparticle which comprises a step of forming a nanoparticle of a compound semiconductor in a cavity part of a protein, in a solution containing the protein having the cavity part therein and an ion of an element to be a material of the compound semiconductor.

2. The method of the production of a nanoparticle according to claim 1, wherein said method comprises a step of forming a nanoparticle of a group II - group VI compound semiconductor in the cavity part of the protein, in a solution containing the protein, a group II element ion, and a group VI element ion.

3. The method of the production of a nanoparticle according to claim 2, wherein said solution further contains an ammonium ion.

4. The method of the production of a nanoparticle according to claim 2, wherein said solution contains a complex ion having the group II element ion as a central metal.

5. The method of the production of a nanoparticle according to claim 2, wherein a complex ion having said group II element ion as a central metal is included in the cavity part of said protein.

6. The method of the production of a nanoparticle

according to claim 3, wherein a complex ion having said group II element ion as a central metal and having ammonia as a ligand is present in said solution.

7. The method of the production of a nanoparticle according to claim 3, wherein a complex ion having said group II element ion as a central metal and having ammonia as a ligand is present in the cavity part of said protein.

8. The method of the production of a nanoparticle according to claim 2, wherein supply of said group VI element ion ( $X^{2-}$ ) into said solution is conducted by adding  $H_2NCXNH_2$  to said solution.

9. The method of the production of a nanoparticle according to claim 8, wherein said X is Se.

10. The method of the production of a nanoparticle according to claim 8, wherein said X is S.

11. The method of the production of a nanoparticle according to claim 2, wherein said group II element is zinc (Zn) or cadmium (Cd), and said group VI element is sulfur (S) or selenium (Se).

12. The method of the production of a nanoparticle according to claim 2, wherein said nanoparticle is formed from at least one compound semiconductor selected from the group consisting of CdSe, ZnSe, CdS and ZnS.

13. The method of the production of a nanoparticle according to claim 1, wherein said protein is at least one of

apoferritin, Dps protein, CCMV protein or TMV protein.

14. The method of the production of a nanoparticle according to claim 1, wherein said method further comprises a step of eliminating the protein by a heat treatment after forming said nanoparticle.

15. A nanoparticle produced by the method of the production according to claim 1.

16. A complex comprising a nanoparticle and a protein, said complex being generated in the production step of the method of the production of a nanoparticle according to claim 1.

17. The complex according to claim 16 wherein said protein has a part which specifically binds to a particular protein.